

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference HP/6122576	<div style="display: flex; justify-content: space-between;"> <div style="width: 40%;"> FOR FURTHER ACTION </div> <div style="width: 60%; font-size: small;"> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. </div> </div>	
International application No. PCT/GB 03/ 00029	International filing date (day/month/year) 07/01/2003	(Earliest) Priority Date (day/month/year) 07/01/2002
Applicant THE UNIVERSITY OF READING		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 7 sheets.
☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

- ☐ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.
- ☒ None of the figures.

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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-15

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-15

The method for encapsulating metal species in a graphitic shell according to claims 1 to 11 and microcapsules with a graphitic shell according to claims 12 to 15

2. Claims: 16-28

The method for encapsulating metal-species in a silica shell according to claims 16 to 22 and microcapsules with a silica shell according to claims 23 to 28.

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Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

Microparticles having a metal-containing core encapsulated in a graphitic shell containing hetero atoms are made by forming, in a liquid medium, colloidal particles containing a metal-oxo species of Fe, Co, Ni, and Pd, colloidally stabilized by a surfactant and containing source material of carbon and the hetero atoms. These particles are pyrolyzed in inert gas to yield the microparticles.

In an other method, silica gel coated particles are formed by colloidally stabilizing particles containing metal species and forming silica at the boundary of the stabilized particle.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B01J13/02 A61K9/50 C01B31/02 C09C3/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B01J A61K C01B C09C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2001/051766 A1 (GAZDZINSKI ROBERT F) 13 December 2001 (2001-12-13) paragraphs [0034] - [0037], [0284] - [0297]	12, 13
Y	paragraph [0292]	13
X	WO 02 00192 A (CARBON MEDICAL TECHNOLOGIES IN) 3 January 2002 (2002-01-03) page 2, line 27 - page 3, line 5 page 3, line 15 - line 27 page 4, line 9 - line 16 page 4, line 26 - line 30 page 9, line 25 - page 10, line 22 page 11, line 10 - line 19 page 12, line 9 - line 12 page 12, line 20 - page 13, line 27	1-15
Y	--- -/--	13

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

10 April 2003

Date of mailing of the international search report

23.06.03

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Cat. No.	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 472 749 A (HWANG J-H ET AL) 5 December 1995 (1995-12-05) column 1, line 26 -column 2, line 13 ---	1-15
A	GADD G E ET AL: "The encapsulation of Ni in graphitic layers using C60 as a precursor" CARBON, XX, XX, vol. 39, no. 12, October 2001 (2001-10), pages 1769-1787, XP004299747 ISSN: 0008-6223 the whole document ---	1-15
Y	US 6 009 457 A (MOLLER MATTHEW DONALDSON) 28 December 1999 (1999-12-28) column 5, line 7-14 column 6, line 14 - line 26 column 6, line 50 -column 8, line 6 column 9, line 30 -column 10, line 18 column 11, line 40 - line 52 column 15, line 15 -column 44, line 43 -----	13

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Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2001051766 A1	13-12-2001	US 2002103417 A1	01-08-2002
WO 0200192 A	03-01-2002	US 6355275 B1	12-03-2002
		EP 1305004 A1	02-05-2003
		WO 0200192 A2	03-01-2002
US 5472749 A	05-12-1995	AU 4282796 A	23-05-1996
		WO 9613339 A1	09-05-1996
		US 5618475 A	08-04-1997
		US 5665277 A	09-09-1997
US 6009457 A	28-12-1999	AU 730214 B2	01-03-2001
		AU 2298597 A	22-10-1997
		CA 2250855 A1	09-10-1997
		EP 0891665 A1	20-01-1999
		WO 9737476 A1	09-10-1997
		JP 2000507715 T	20-06-2000